Manual for Building Cost-effective Green Crab Housing for Soft-shell Production Using ADPI Oyster Bags

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Overview:

This manual provides step-by-step instructions for building cages that provide individual housing for green crabs (what we're calling green crab "condos") and is designed for anyone interested in producing soft-shell green crabs. After trapping or collecting crabs and identifying crabs in the pre-molt stage (see The Green Crab Guide)[1] it is critical to separate them. This prevents vulnerable newly molted crabs from being cannibalized by crabs that have yet to molt. These condo cages provide individual housing for crabs to protect them once molted and are designed to be easily handled for frequent checking of molts and removal of soft-shell crabs. We hope this manual supports your efforts in building effective gear needed to produce soft-shell crabs and easily scale up production!

1 https://seagrant.unh.edu/sites/default/files/media/2023-02/green-crab-guide-2022.pdf

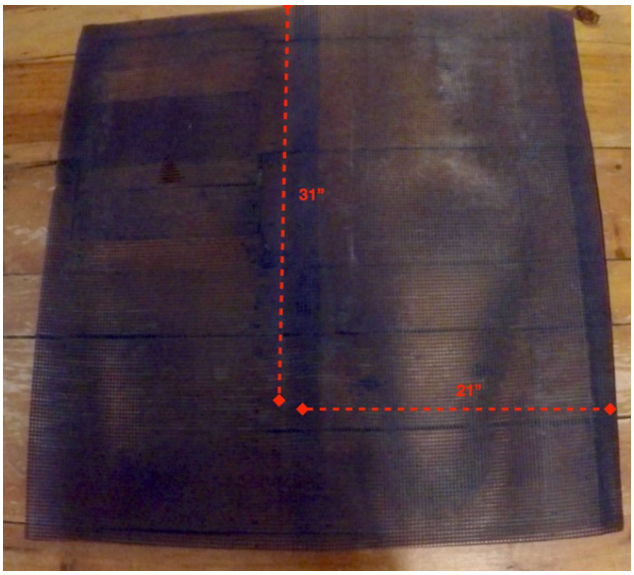
The Details:

This manual provides step-by step instructions for building "green crab condos", out of ADPI oyster bags. The dimensions allow for four condos to be stacked inside a standard size floating lobster crate (L: 31.5", W: 20", H: 16"). Through multiple design iterations, we found that this method worked best for us, but there are many ways to customize or make changes to this design based on your needs. Cable ties can be used interchangeably with hog rings, or a combination may be used. These condos are durable and will last for multiple seasons although you may need to replace the occasional hog ring or cable tie over time. They will become fouled if left in the water for extended periods of time but can easily be cleaned by removing them from the water and letting air dry or scrubbing and pressure washing before returning to use.

Materials:

- **2, 4mm mesh high density polyethylene square mesh (ADPI) oyster bags, tube style, not sealed on one end.**
  - » **Where to buy:** can be found at your local aquaculture or marine supply store, or ordered online
  - » **Cost:** ~$7 each
- **~100 (3oz) 1/2" stainless steel hog rings**
  - » **Where to buy:** can be found at your local marine supply store
  - » **Cost:** usually sold by the pound, ~$8/lb
- **7' 3/16" diameter shock cord**
  - » **Where to buy:** can be found at your local marine supply or hardware store
  - » **Cost:** usually sold by the foot, ~$0.30/ft
- **Hog ring pliers**
  - » **Where to buy:** can be found at your local marine supply store
  - » **Cost:** ~$20
- **1 pack of 4" cable ties**
  - » **Where to buy:** can be found at your local hardware store
  - » **Cost:** ~$6 for a pack of 100 cable ties
- **Sharp knife (box cutter/utility knife)**
  - » **Where to buy:** can be found at your local hardware store
  - » **Cost:** depends on knife, ~$10

Instructions:



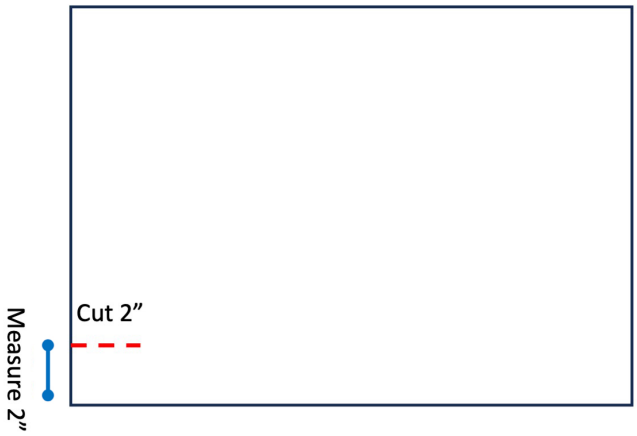
1. Cut down one side of the oyster bag so that there is only one layer of mesh, repeat this with both bags.

2. Measure out one 31" x 21" rectangle, cut this out from the mesh (this will become the top of your green crab condo). Repeat the process with the second oyster bag for the bottom. Keep the extra material which will be used later in the condo buildout.

3. One of the rectangles will be used to form the top of the crab condo.

   a. From one corner, measure 2" towards the center along the short side, and from this mark draw a 2" line parallel with the long side.

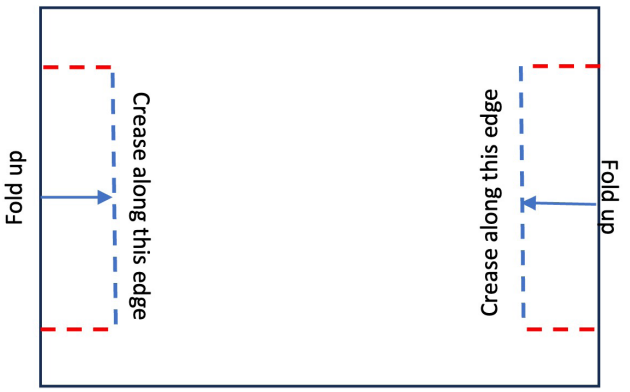
   b. Cut along that line, creating a panel that will eventually fold to create a corner.

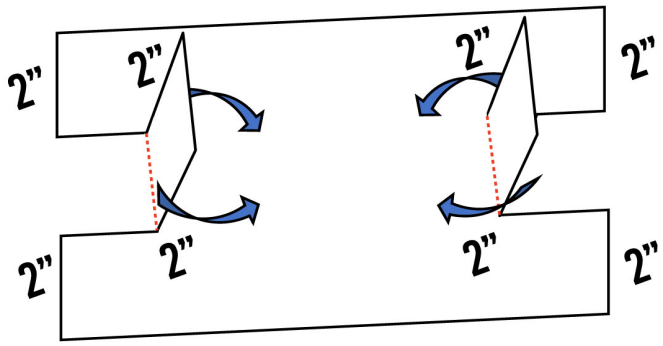


   c. Repeat this process by doing the same thing on the other 3 corners.

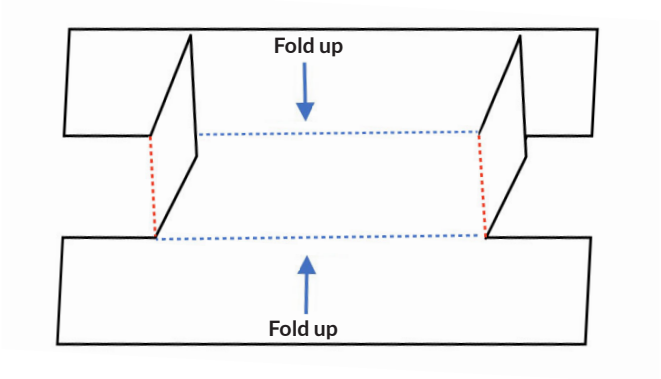
   d. You should now have four slits, that will allow you to fold the bag into a 3-D rectangular structure.

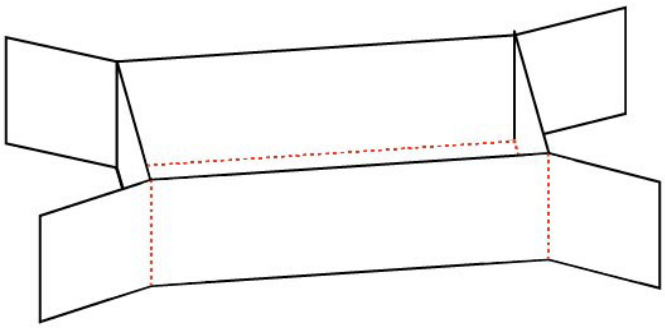
e. Fold the short side up and crease the mesh along the dotted blue line in the figure below. Do this on both sides.



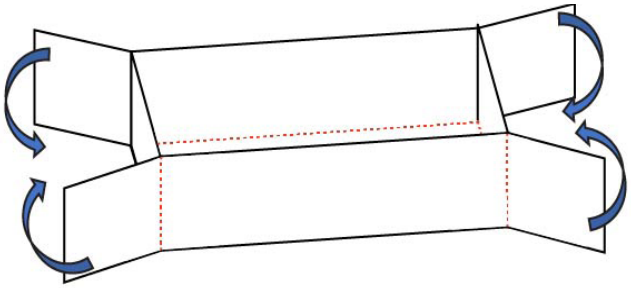


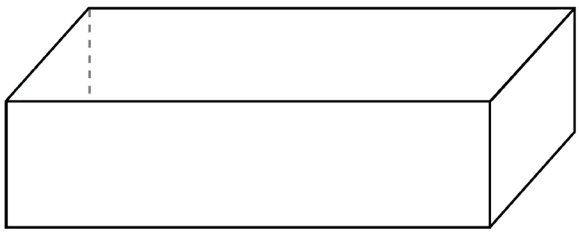
f. Fold the long side up and crease the mesh along the dotted blue line in the figure below. Do this on both sides.



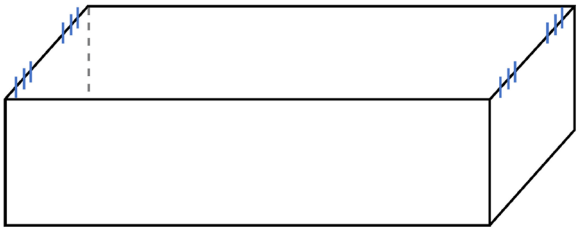


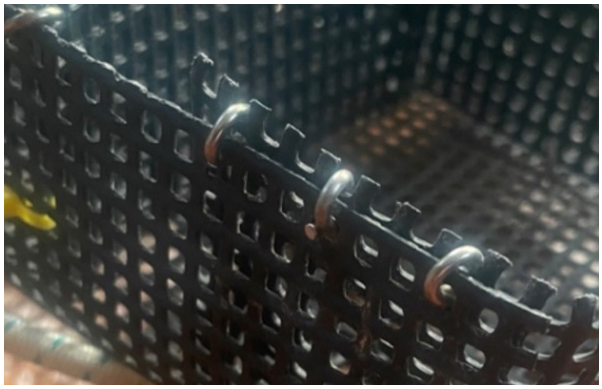
g. Take the long side and fold tabs up to meet short edge and form a corner.



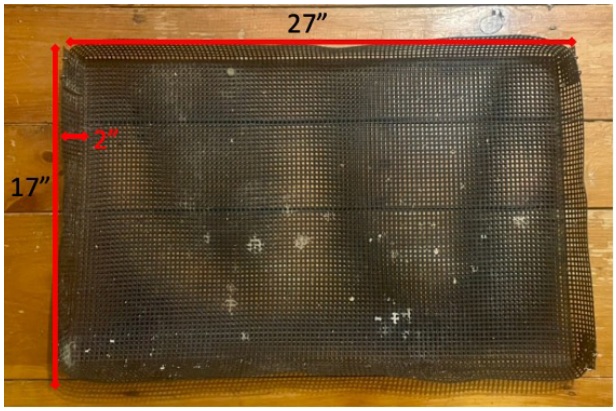


h. Using hog rings and hog ring pliers, or cable ties, fasten together the two pieces of mesh at each corner to secure the 3D rectangle structure. The blue marks in the figure below show where the hog rings should be attached.





i. The top of the condo is now complete, the dimensions should be 27” x 17” x 2”.

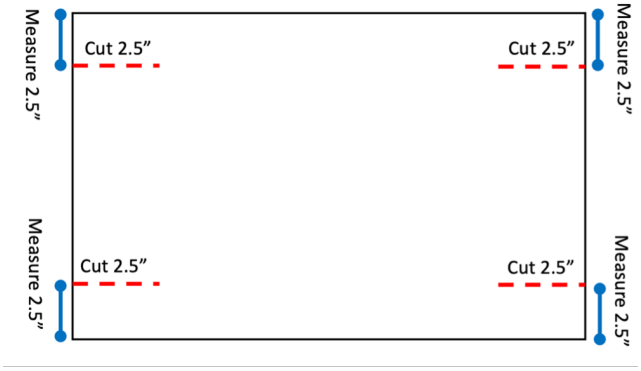


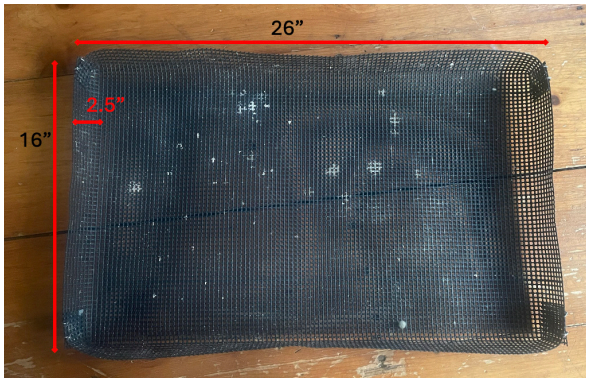
4 The second 31” x 21” rectangle will be used to form the bottom of the crab condo.

a. From one corner, measure 2.5” towards the center along the short side, and from this mark draw a 2.5” line parallel with the long side. Cut along that line. Repeat this on all four sides.

b. When complete, the bottom will look identical to the top, but with dimensions that measure 26” x 16” x 2.5”.

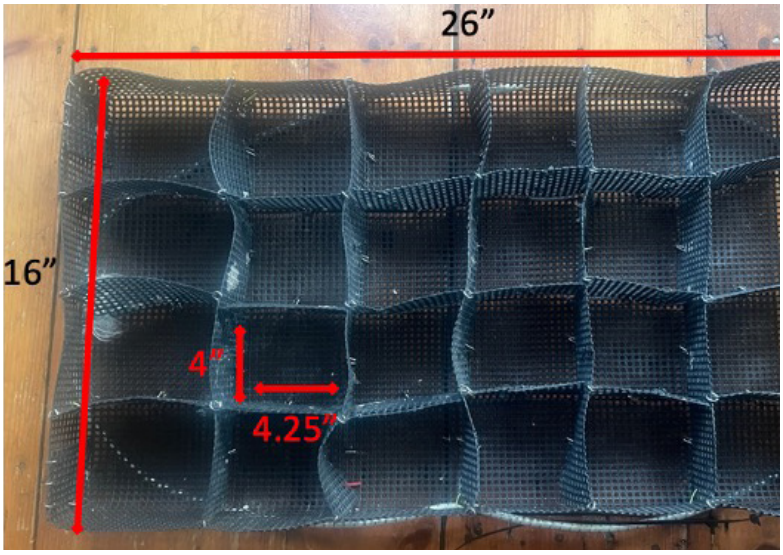
c. Repeat steps e-h



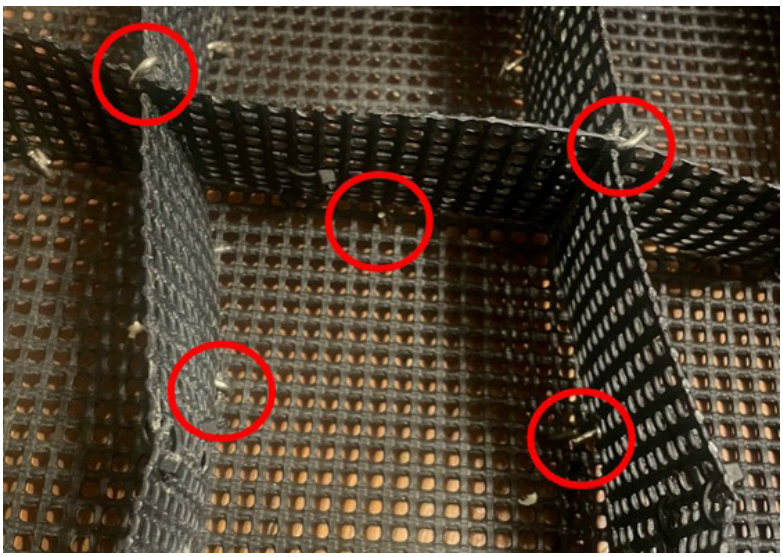


5 Next, construct the individual slots for the green crabs. Each slot is 4.25” long by 4” wide, with a total of 24 slots in the condo.

a. From the remaining oyster bag material, cut three strips of mesh that are 2.5” wide and 26” long (you may have to trim it slightly so that it is just under 26” long to fit inside the bottom) and cut 20 pieces of mesh that are 2.5” wide and 4” long.



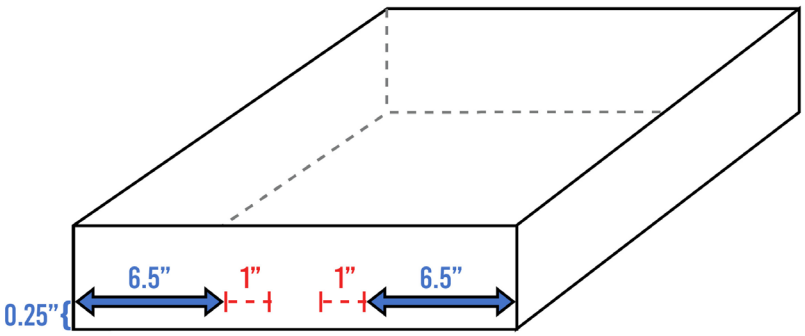
6 Once you have these pieces cut, work systematically to make a grid with slots that are 4.25” long and 4” wide. As you piece it together, use hog rings or cable ties to connect each piece to the next and to the bottom or side of the condo. Make sure to trim off the tails of the cable ties.



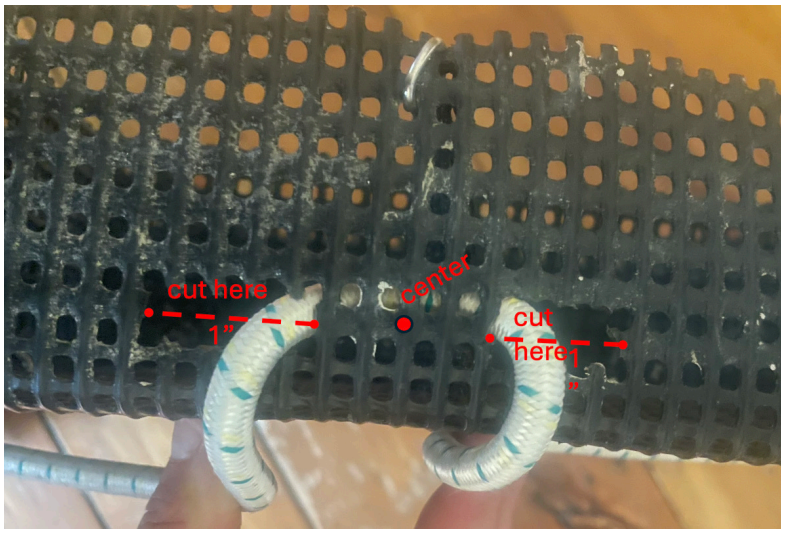
7 Once the bottom is fully intact with all the individual slots, attach the shock cord which is used to secure the top of the condo to the bottom.

a. The bungee cord will be attached at the center of each side of the cage, approximately ¼” from the bottom. On one of the short sides, measure 6.5” towards the center from the edge. Then, make a 1” cut towards the center, marked by the dashed red lines in the figure to the right. Do the same thing from the other edge.

b. It’s important that the cuts are approximately 1/4” from the bottom so that the top of the cage doesn’t interfere with the bungee.



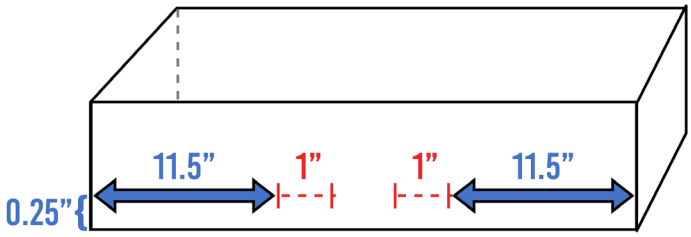
c. In each of the 1” cuts, clear out two rows of mesh so the bungee cord can pass in through one cut and then out through the second cut.



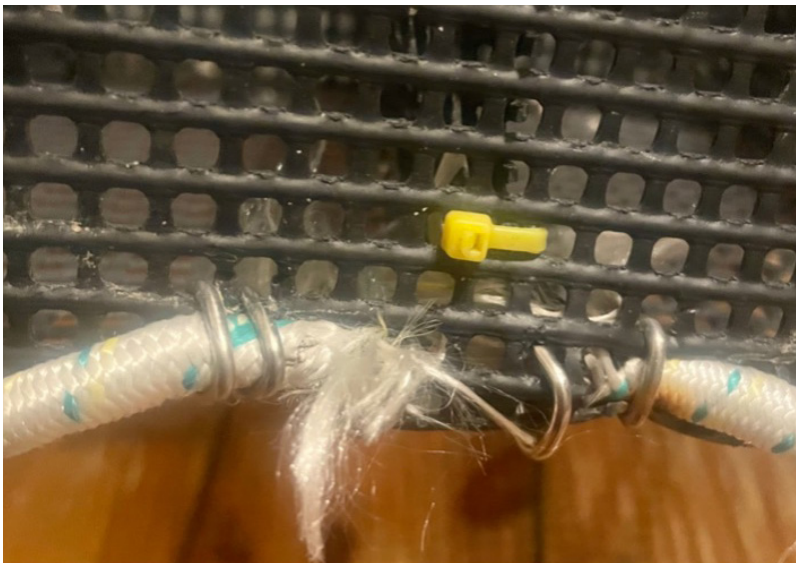
8 Repeat this process on the other short side.

9 On the long sides, you’ll do the same thing except you will measure 11.5” towards the center from each edge and then make a 1” cut, marked by the dashed red lines.

a. Repeat this process on the other long side.



10 Lace the shock cord through all cuts, making sure it is laced through the outside of the cage so the lid can be secured. Once the shock cord has been looped through all of the cuts, pull out any slack so cord fits tightly around the condo and cut so there is no excess cord remaining. Hog ring the ends of the shock cord onto one end of the cage.



11 You can now put the top on the condo, take the bungee and bring it over the corners so the top is firmly secured to the bottom.

For more information on the soft-shell green crab fishery, please visit our websites:

manomet.org/project/fisheries

seagrant.unh.edu/our-work/invasive-species

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